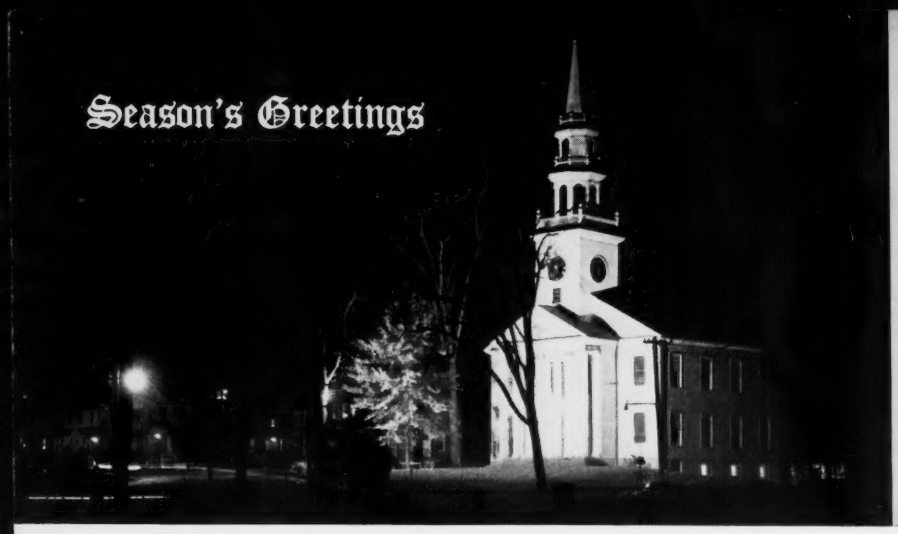

Monthly Review

Federal Reserve Bank
of Boston

December 1953

ANNUAL REVIEW OF NEW ENGLAND BUSINESS

1953—Record Year Despite Downturn

Production, employment, income and retail sales established post World War II annual records in New England during 1953. Prices remained relatively stable throughout the year so that consumers enjoyed increased real income. Individuals also continued to add to their liquid savings at a steady rate. New defense contracts provided less stimulus to New England business in 1953 than in the two preceding years. Inventories increased rapidly during the first part of the year. But businessmen curtailed their rate of ordering, and manufacturers reduced production somewhat after mid-year to bring output into better relation with sales. While some of the vigor had gone from the boom by the end of the year, business continued at very high levels.

WHEN ALL the figures are in, 1953 will probably rank as New England's most prosperous year on record, even though the trend of general business activity was slightly downward toward the end of the year. During the first quarter, expansion continued and production and sales recorded new peace-time highs. In the spring, activity leveled off at near-record rates until July, when vacation shutdowns caused dips in many lines. Business in some sectors did not recover to springtime levels after the summer shutdowns as businessmen reappraised shrinking order backlogs and rising inventories. New orders, production, sales, and employment eased off after mid-year. Manufacturers reduced their purchases of materials and parts in an attempt to get inventories into better balance with sales.

Consumers in New England began to spend more carefully and to demand better values in 1953. More competitive markets appeared for such items as television sets, automobiles, furniture, and household appliances. More goods were sold at discounts and at special sales as the year progressed.

Total **nonagricultural employment** in New England remained relatively stable throughout 1953, although it turned slightly downward after March. In every month of 1953, employment was at a higher level than in the same month of 1952. Durable-goods manufacturers, mainly responsible for the year-to-year expansion in employment, reached a post-war employment peak in June. Contrary to the usual seasonal pattern, total manufacturing employment declined in the autumn, falling to a level slightly above the 1952 level. In October, employment in the soft-goods industries was two per cent below that of the previous year. Responsibility for this decrease can be partly attributed to a nine per cent decline in the textile industry and a four per cent drop in the leather industry, both of which were rapidly adding workers in the fall of 1952.

The total volume of **production** in 1953 will exceed that of any peace-time year despite a fall downturn. During each of the first ten months of 1953, industrial output in the nation, as measured by the Federal Reserve Board's index of industrial production, surpassed levels recorded in any year since World War II. Contrary to the experience of most post-war years, production began to decline rather than increase after July.

Most New England general business indicators closely paralleled the national experience. **Electric power output** in New England remained above 1952 levels throughout 1953, although the margin narrowed after July. **Freight carloadings** of New England railroads ran slightly below the 1952 volume during the first quarter and then exceeded year-ago figures from April until September, when they turned downward. New England's comparative **business failure record** was better than that for the country as a whole. In the nation both the number of business failures and the dollar liabilities of bankrupt concerns exceeded 1952 levels in every month after April. But in New England, the number of business failures exceeded those in 1952 only in July and September. Dollar liabilities showed an increase in only one month, September.

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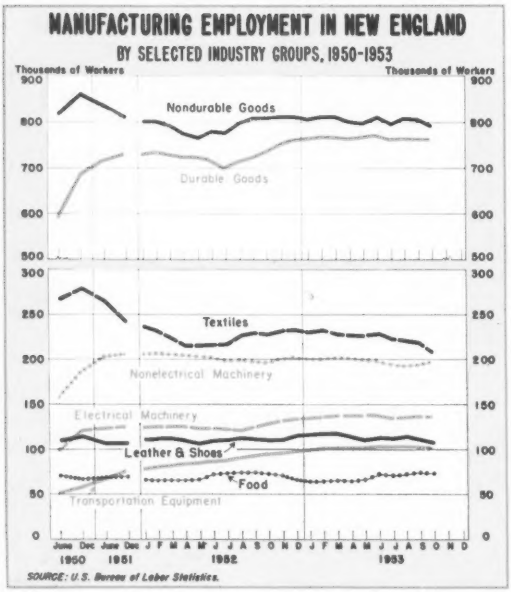


The volume of **new orders** placed with the region's manufacturers decreased gradually after April. This is a reversal of the general trend a year ago when new orders increased during the fall. As the year progressed, purchasers began to take advantage of the comparatively short time needed for deliveries. Consequently, new orders closely reflected actual demand as buyers adopted conservative policies. Manufacturers were encouraged by the few order cancellations they received.

Inventories of manufacturers have been building up since early spring. In the second quarter the greatest accumulation was in raw materials and work-in-process inventories, but by the end of the year the concentration had shifted to finished goods. This indicates that manufacturers whittled down their order backlogs and that production continued to exceed sales.

New England business received less stimulation from the defense program this year. The value of **defense contracts** received by New England manufacturers during the first nine months of 1953 declined about one third from the value in the similar period of 1952.

Government-granted **certificates of necessity,** encouraging plant expansion by allowing rapid depreciation of new facilities, also dropped in 1953 as the program neared completion. The value of certificates received by New England manufacturers totaled $130 million for the first ten months of 1953, 27.5 per cent less than in 1952. Every industry group received a smaller amount than last year. Durable- and nondurable-goods producers received nearly equal amounts, but the durable group experienced a greater decline from 1952 levels.

New England's **construction** activity reached record levels during the first quarter, showed signs of slowing in mid-year, and zoomed upward again in October. Home-building, however, remained below 1952 levels after mid-year. At the end of November the total value of New England construction contracts awarded in 1953 was four per cent ahead of the corresponding value for the first eleven months of 1952. Figures for residential and nonresidential building, and for utilities construction stood at higher levels though the value of awards for public works was lower, according to the F. W. Dodge Corporation.

Nonresidential contract values ran 13 per cent ahead of last year during the first eleven months — 63 per cent ahead in October. The value of contracts for residential building awarded in November was 28 per cent below the value of the November 1952 awards. As a result of the very active winter months, the eleven-month figure was five per cent higher than last year.

There was no general scarcity of **mortgage money** in New England in 1953. But in the first nine months, mortgage acquisitions by New England lenders reflected the generally tighter credit situation. Purchases of mortgages outside the district were curtailed, and higher standards were demanded of borrowers within the district. A shift took place from VA and FHA mortgages to conventional types with higher rates, larger down-payments, and shorter maturities. In the fourth quarter, larger lenders resumed their interest in purchasing mortgages outside the region, and began investing more heavily in VA and FHA mortgages.

Total **business loans** at New England's weekly reporting member banks reflected the high general level of business activity in 1953. They expanded contra-seasonally in the first quarter, tapered off in the second quarter, rose moderately in the third period, and declined during October and November. The leading borrowers in the first quarter were sales finance companies and trade firms because of the high level of retail sales, and textile and leather manufacturers who were building up inventories. During the second quarter textile and trade firms expanded their borrowings, while other categories of business made net repayments, mainly to fund bank debt.

A moderate rise in loans during the third quarter was attributable largely to expansion of loans to sales finance companies and trade firms, offset by small net repayments in most other lines. During the fourth quarter, loans to commodity dealers and trade firms rose, but slightly lower business activity, accompanied by inventory cutbacks and sizable repayments by sales finance companies, caused total business loans on November 25 to drop to about their level a year ago.

Unemployment Remains Low

Unemployment, as measured by unemployment insurance claims, remained at a very low level throughout 1953. Unemployment for the year was the lowest in the post-war period. Contrary to the usual pattern, there was a decided upsurge in initial claims in the fall. Textile cities suffered the most, although unemployment claims did not fully reflect this condition due to the exhaustion of benefits by some workers and the withdrawal of others from the labor market.

A shortening of **hours worked by factory employees,** which became evident early in the year, continued into the final quarter of 1953. Reduction or elimination of overtime was reported by many plants in the durable-goods field and part-time operations because of seasonal dullness prevailed in many soft-

goods industries in New England.

Average hourly earnings continued at a record high in most industries throughout 1953. The shortening of workweeks toward the end of the year, however, resulted in some decline in **average weekly earnings** from the high level recorded earlier in 1953. Average weekly earnings in October, however, were still above the comparable month of 1952 in every New England state except Rhode Island and New Hampshire.

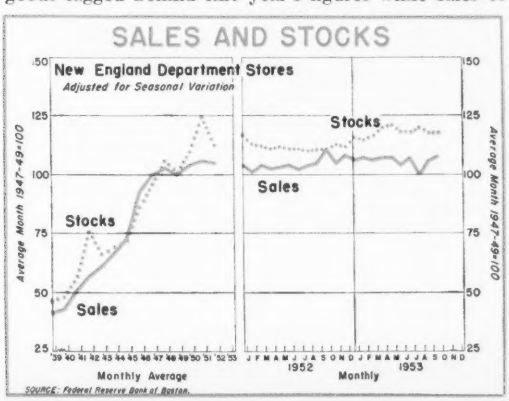
Total **income** of individuals in New England in 1953 exceeded that of 1952, although the margin over the preceding year decreased as the year wore on. No marked change occurred in the relationship between total spending and saving.

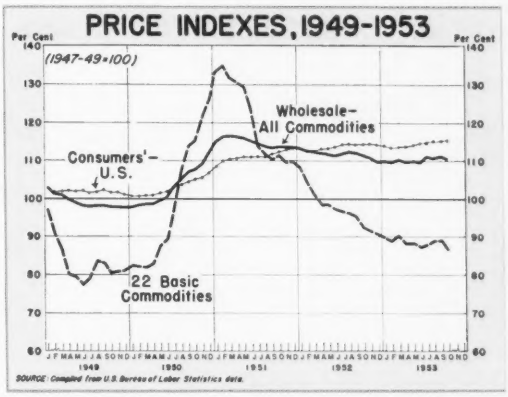
New Englanders continued to add to their **liquid savings** at a steady rate during 1953. Deposits at mutual savings banks increased at a faster rate in 1953 than in 1952. Life insurance sales for the first ten months of the year were 17 per cent above those in the same period a year ago. Savings bonds were not as popular in New England as other forms of savings; redemptions exceeded sales in 1953.

Total **retail sales** in the nation during the first nine months of 1953 were six per cent greater than in the corresponding period of 1952. Retail sales in the two New England metropolitan areas for which data are published showed year-to-year gains well above the national average for the same period. The increase in the Boston area was 12 per cent and in the Providence area 11 per cent.

The largest year-to-year gains were recorded by **motor vehicle dealers,** whose sales were up 34 per cent in the Boston area and 31 per cent in Providence. Further evidence of the impressive sales of automobiles appears in the large gain in registration of new cars in Massachusetts. At the end of November, new car registrations in the state were 47 per cent greater than they were in the first 11 months of 1952 and 2 per cent larger than registrations in the same period of the previous record year of 1950.

The seasonally adjusted index of New England **department store sales** displayed marked stability in 1953. October was the fifth month this year to have an adjusted index of 106. Three of the other five months had indexes of 105. The index dropped below this level only in June and August. Sales of consumer durable goods lagged behind last year's figures while sales of





soft goods did better than a year ago in department stores. Total sales during October were three per cent less than those in October 1952, but sales for the first ten months of the year were two per cent greater than they were last year.

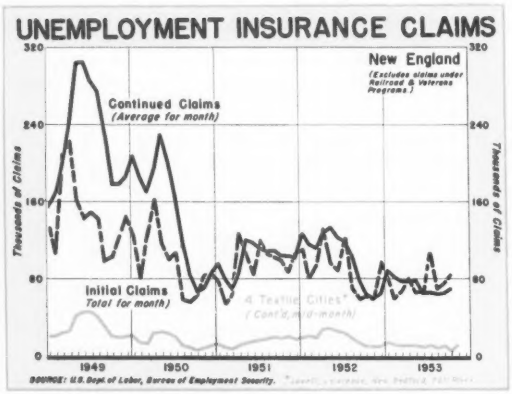
Retail sales in 1953 were supported in part by an increasing volume of **consumer credit.** Each month the volume of credit extended to New England consumers by banks, small loan companies and credit unions exceeded that in the corresponding month of the preceding year.

Although the majority of New Englanders enjoyed higher incomes in 1953, **farmers** as a group did not. Gross farm income in New England during the first nine months of 1953 declined six per cent from its level in the same period of 1952. Total income from livestock products was about the same as during the first three quarters of 1952. It remained stable primarily because the higher prices poultrymen received tended to offset smaller milk checks received by dairymen.

Cash receipts from crops were 20 per cent less in the first nine months of 1953 than in the same period of 1952, largely because of lower potato prices in the first half of 1953. Lower potato prices were instrumental in causing a 32 per cent decline in cash receipts from all crops in Maine.

Nonagricultural **price changes** did not make startling news during the year even though all price controls were removed by March. The average of wholesale prices in the nation experienced only minor fluctuations and by November had fallen less than one per cent below its November level in 1952. Wholesale farm prices declined almost eight per cent, but this was counterbalanced by rising prices for nonmetallic minerals and fuel, power and lighting materials. The national Consumer Price Index continued the upward trend begun in 1950, but the rate of increase slackened considerably. During the first ten months of 1953 average consumer prices increased only 1.3 per cent in the nation. Most components of the Index leveled off in 1953. The major exceptions were rents and services, which continued climbing.

Vacation business was generally satisfactory for New England lodging proprietors in 1953. Receipts and occupancy for the first ten months exceeded those for the corresponding period of 1952 in most areas.



Nondurable-Goods Industries

Mixed trends characterized New England's nondurable-goods industries in 1953. Textile, apparel, rubber, and shoe and leather plants generally experienced good business in the first half, but had to curtail production after mid-year as demand for their products declined. Most jewelry, pulp and paper manufacturers, and printing establishments enjoyed a strong market throughout the year.

In the last half of 1952, most segments of the New England **textile industry** were expanding operations. In sharp contrast, a tapering off which started in March accelerated in the last half of 1953. Since September the industry has operated below the levels of a year ago and in October employment fell to the lowest level in many years. Reduced hours and staggered workweeks have been instituted in many areas. Earlier in the year the woolen and worsted segment of the industry bore the brunt of the slowdown in demand for textile fabrics, but by the last quarter all segments of the industry were affected. Demand for broad woven cotton and silk goods held up better than demand for wool fabrics and synthetics. The volume of spring orders has been disappointing and many mills are now putting their hopes on an improvement in fall business. Inventories are not considered excessive. Any pickup in demand is expected to be quickly reflected in mill operations.

After reaching the fall seasonal peak in October, the usual between-season lull developed at New England **garment plants.** Layoffs occurred at many plants and part-time operations were general. Business in the second half did not come up to the late 1952 and early 1953 levels. The prolonged spell of warm weather in the fall hurt heavy outerwear sales especially. Retailers have been cautious in placing orders for spring merchandise. Men's wear plants have been affected more than most other lines.

New England **shoe production** for the first nine months of 1953 amounted to nearly 131 million pairs, a gain of one per cent over the comparable period of last year. Output expanded rapidly in the second half of 1952 and continued at a very high level into early 1953. By late spring, however, it became apparent that production was outstripping retail sales. As a result, output was reduced in the second half and both production and employment fell below 1952 levels. The curtailment was felt principally by women's shoe producers, although reduced military buying affected men's shoe plants. Output of slippers and juvenile shoes continues at a high level. Retailers have been cautious in ordering for spring but industry spokesmen believe that accumulated inventories have now been worked off. In November there was some pickup in activity at tanneries and shoe finding shops as manufacturers placed orders in anticipation of satisfactory spring business.

After expanding for over a year, employment in the **rubber products industry** in New England declined for the second month in a row in October and in that month was down to the level of a year ago. Slow demand resulted in curtailment of tire production. The long dry spell during the fall caused some cutbacks of output for waterproof footwear.

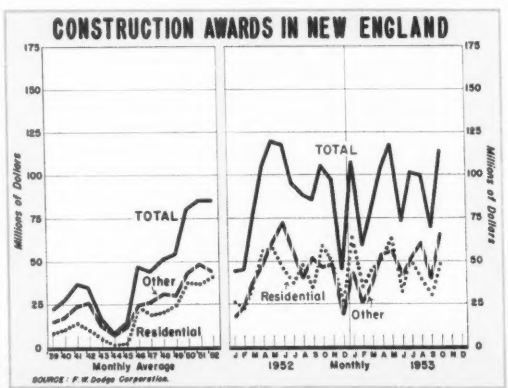
Pre-Christmas expansion of costume **jewelry** shops during the 1953 fall season reached unprecedented proportions. The number of workers employed by the industry in October was at an all-time high. In contrast to other years when materials or inventories were troublesome, the most pressing problem in 1953 has been to find sufficient experienced help. Part-time night workers were used at many plants to complete scheduled production. Favorable response to the showing of spring lines is expected to minimize the usual between-season lull in the industry.

Monthly employment in the **printing and publishing industry** has been above the 1952 levels since April. Employment declined slightly in October but it is expected that seasonal expansion will boost work forces for the balance of the year.

Activity in the region's **chemical industry** expanded slightly during 1953 as chemical facilities built under certificates of necessity came into operation. In the manufactured gas industry, several hundred workers were displaced as the result of the introduction of natural gas.

New England **paper manufacturers**, largely specializing in fine and specialty papers, enjoyed a strong market during most of 1953. During recent months, distributors and consumers have had to adjust to deliveries later than they would like.

The market for most grades of wood pulp has recently been in close balance. Supplies are ample but there is no surplus. Prices of pulp and paper remain firm.



Durable-Goods Industries

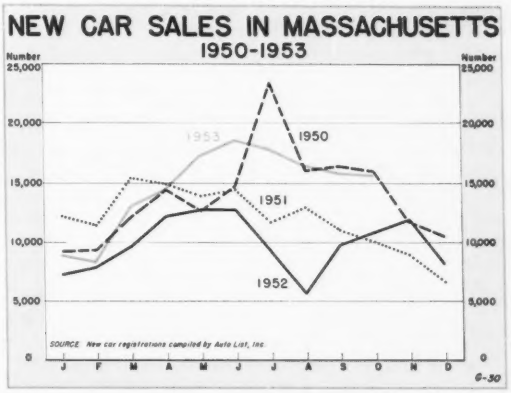
Durable-goods producers continued to add workers in 1953. Most manufacturers of hard goods enjoyed an active market during the first part of the year. A decline in new orders led to cutbacks in production and employment in many firms during the second half. Some industries, however, such as aircraft makers in Connecticut, continued to expand throughout the year.

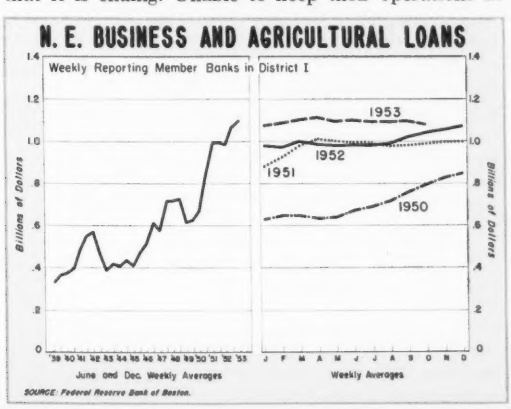
Activity in the production of **electrical machinery** and equipment in New England eased off slightly during the summer. The ending of the Korean War and the failure of orders for some lines of commercial production to materialize necessitated cutbacks and resulted in small layoffs at a majority of the plants in the industry. A decline in demand for radio and television components was among the major causes of the tapering off. Employment in the industry at mid-October was 1.7 per cent below the all-time peak of 138,200 workers reached in May. Production cuts probably exceeded this, since employment reports do not show the effects of reductions in working hours. Nevertheless, skilled workers and technicians are still in demand.

Production, sales, and employment in New England's **nonelectrical machinery industry,** with the exception of the textile machinery segment, continued at very high levels throughout 1953. Activity in Massachusetts increased during October as 3,200 striking employees at two large plants returned to work. Minor changes at other Massachusetts plants resulted in an additional gain of 300 workers. Employment eased off in all other New England states except Vermont.

The **machine tool industry** continues very busy nationally, although average order backlogs have been whittled down to seven months' output. New orders have been falling sharply. Machine tool makers in New England making the standard types of tools are not as busy as those in other parts of the country where the larger machine tools are produced. Several machine builders in the Boston area are operating at a high rate, but others are below the earlier peak. As defense work fades, machine tool firms are depending more and more upon the large replacement and modernization market.

Textile machinery makers have been experiencing their worst slump in 35 years. The decline started in the spring of 1951 and as yet no signs have appeared that it is ending. Unable to keep their operations at more than about one-third of their potential capacity, manufacturers have tried to diversify.





Activity slackened after midyear in New England's **primary and fabricated metal industries** with the supply situation changed from one of shortages caused by war demands and the steel strike to one of a buyer's market and excessive inventories. Foundries have reduced their work forces somewhat. Small cutbacks have taken place at plants making such fabricated metal products as screws, blades, structural steel rivets, and valves.

Brass mills have been making deliveries against old orders at a much faster clip than the rate of incoming business. Order backlogs of brass mills started falling in July and have continued to drop. In Waterbury, Connecticut, brass mills have reduced their workweek in some fabricating departments.

The **transportation equipment industry** in New England continued to grow during 1953, primarily due to steady expansion of the aircraft segment in Connecticut. Employment in the transportation equipment industry increased by 4,600 in the 12 months ending October 1953. Connecticut gained 8,200 workers during this period which more than offset losses in other New England states, chiefly Massachusetts, where shipbuilding activity has diminished. New aircraft plants and additions to existing plants now under construction indicate that Connecticut's aircraft industry will continue to grow.

New England **lumber producers and dealers** sold in an active market during the first half of 1953. Weaknesses appeared and prices moved downward during more recent months. Lower grades of locally-produced softwood and hardwood lumber moved progressively more slowly.

Business for New England **furniture manufacturers** dropped from boom levels to merely good conditions after the first quarter of 1953. Selling effort became increasingly essential as the year advanced. Order backlogs shortened, and although working time was reduced, most operators were still on overtime schedules through the fourth quarter. Retail sales have held up well and manufacturers have confidence that new styling, attention to quality, and aggressive selling will result in a satisfactory volume of business through the winter period.

Monthly Review
FEDERAL RESERVE BANK OF BOSTON

THE IMPACT OF Science in the Fishing Industry–I

by DANIEL P. NORMAN[1]

Innovations originating in electronics, biology, chemistry and other fields are accelerating changes in the traditional methods of catching, processing and marketing fish. This article discusses such electronic devices as echo sounders, which are coming into wider use for navigation and also for the accurate measurement of the depth and density of schools of fish. A subsequent article will discuss developments in the use of specially treated synthetic fibers for fish nets and the increased efficiency which improved boats, new refrigeration processes, and filleting machines are bringing to the fishing industry.

ELECTRONIC EQUIPMENT and other technical innovations are causing great changes in the fishing industry. This and a succeeding article review some of these new developments and their consequences for New England, where fishing has been a major occupation for many generations. Traditional relationships and methods are being reviewed in the light of increased mechanization and new developments in textiles, chemistry and biology, as well as in electronics. These innovations bear such promise for the New England fishing industry that they merit thorough consideration as problems of the industry receive attention.

In the fishing industry age-old methods and processes continue to operate alongside and in sharp contrast to the new. Technological progress tends to be obscured, however, by the emphasis placed on the economic difficulties of the industry and on developments in labor relations. General understanding is also hampered by the fact that the fishing industry has three almost independent branches: catching, processing, and marketing. Progress in the processing and marketing of fish is concealed by over-all progress in the food industry. Developments in the catching of fish are obscured by nostalgic recollections of sailing days or romantic conceptions of the ocean's immense resources. Yet in all three of these fields the industry of two decades ago is vanishing. The transition though gradual has accelerated steadily since World War II.

Electronics and Fishing

Fishermen have long been used to going far out to sea to find their catches. In every war, fishing boats have served as naval auxiliaries. It is natural, therefore, to find fishermen using all the latest navigational devices developed by naval and commercial marine traffic. Radar, loran, and ship-to-ship radio telephones have all been pressed into service to assure the safe return of fishing boats in every weather and to enable fishermen to regain any given spot in the ocean where the fishing was previously found to be good.

One device, the echo sounder, has become more than a mere navigational assistant. This device determines the depth of water under a vessel by measuring electronically the time in which a signal emitted from a ship bounces back from the sea bottom. The echo sounder rapidly replaced the sounding lead as a means of determining the depth of water under a ship's keel and became standard equipment on all larger ships.

It was quickly recognized that the echo sounder was of major importance to the fishing industry. Placed on fishing vessels experimentally in the middle 'twenties, the first commercial equipment was leased to the fisherman *Breeze* in 1928. By 1933 echo sounders for navigational purposes were standard installations on all the larger trawlers and now they are carried even by some small lobster boats. The rapid spread of the device through the fishing fleet was due not only to its value in locating known fishing grounds but also because it could detect large schools of fish under the vessels. For example, in the cod fishery, the echo sounder not only locates the shoal but enables the fishermen to ascertain where the fish are the most numerous, thus avoiding the former inefficient trial and error method.

Norwegians Pioneer in Use of Echo Sounder

Systematic studies in the use of echo sounders for locating and identifying schools of fish were first published in 1935 by Norwegians, who have continued to be leaders in this field. When the studies were first made public, fishermen thought the whole story so improbable that they refused the Norwegian government's offer of technical assistance. As echo sounders became more plentiful in the fishing fleets, European fishermen gradually became convinced of the soundness of the original reports and requested government assistance in locating fish. Today, a Norwegian research vessel has been assigned the sole task of locating the shoals of herring and keeping the fishing fleet informed by radio of the abundance and distribution of the fish.

In the herring fisheries echo sounders not only assist in the detection of the fish, but also indicate whether the shoals are dense enough to permit economic purse-seine fishing and whether a full length of seine may be used without danger of breaking because of the weight of the fish. The echo sounder is also used to chart shellfish areas and ocean depths, and to study plankton. Recent refinements make it possible to differentiate among species of fish. Today, over four-fifths of all American and British fishing vessels are equipped with echo sounders, which are being used to increase the catch of cod, herring, sardines, anchovies, tuna, and lobsters. Although there is no way to assess quantitatively the increase in catch

[1] The author, Director of Research of the New England Spectrochemical Laboratories in Ipswich, and President of Skinner & Sherman, Inc., Boston, prepared this article under a research grant from the Federal Reserve Bank of Boston. The findings and conclusions are the author's. They are published by this Bank because of their widespread interest to the New England community.

A bibliography on this subject prepared by the author is available from the Federal Reserve Bank of Boston.

which can be directly attributed to the use of echo sounders, fishermen have testified repeatedly that the echo sounder has enabled them to find fish where they would not otherwise have found them.

The echo sounder is constantly being improved. The transmission power and impulse rate are being increased; the beam angle, frequency range, and spurious electrical pickup are being reduced. Horizontal as well as vertical echo ranging is now practical. A new scanning device has recently been put into production which will range out at any angle from horizontal to vertical and locate fish or other objects at various depths. These improvements are likely to open a whole new field of commercial fishing in the near future.

Various types of mid-water trawls have been developed in an attempt to catch fish away from the bottom. Since the ordinary echo sounder can locate fish only immediately beneath the fishing vessel while the trawl is towed many hundreds of feet behind, it is of no use in guiding the trawl to the mid-ocean fish. An echo sounder with a substantial horizontal range would be of considerable value in guiding the net to the fish. Equipment for such work is still too expensive for individual fishing boats to use, but preliminary tests by the Norwegian fisheries research vessel, *G. O. Sars*, have been so successful that many firms are working rapidly on the development of equipment suitable for commercial fisheries.

These developments are of immense importance to New England redfish fishermen. Today redfish are caught only in daylight because they seem to rise off the bottom of the banks at night. If it were possible to locate them satisfactorily in mid-water at night, redfish trawlers could reduce substantially the time it takes to fill their holds and thus could increase the number of trips and the amount of profit.

A new development in echo finders which has just been introduced from Germany by Radiomarine Corporation is the Fischlupe, or cathode ray depth sounder, specially designed to function as an electronic fish-finder. This instrument begins to bridge the gap between the conventional echo sounder and underwater television. The conventional echo sounder sends out a signal which is reflected back by the first object it meets. The Fischlupe is capable of surveying any selected section of the water from vessel hull to sea bed. When fish intercept the sonic beam, an indication appears on a cathode ray screen, enabling the operator to determine at what depth the fish are swimming. He can secure a magnified trace of an eight-fathom section of water centered on the fish. Accurate measurements of the depth and density of the fish may thus be obtained.

Many Types of Electronic Equipment

The echo sounder is not the only electronic instrument which the fishing industry has adopted. For example, radar is now used to assist whale factory ships in locating whales killed by killer ships. Such purely wartime devices as sonar and asdic, used originally to track submarines, are now used to track fish. A recently launched Maine dragger carried the following electronic equipment for fish finding and navigation: a Sperry electric helmsman and magnetic compass pilot, two Bendix depth recorders, a loran unit, a radar set and an R.C.A. radio-telephone. It is interesting to note, however, that it did not carry a radio-direction finder, which was formerly standard equipment on all vessels. Today loran though expensive is so precise that it completely antiquates the radio direction finder.

One deterrent to the use of expensive new equipment on New England fishing vessels is that these craft operate on a share basis, with part of the gross profit, after the deduction of certain expenses, going to the crew and part to the owners. When new equipment becomes available, there is usually considerable friction between the sharers until agreement is reached as to which group should pay for the rental or maintenance of the new equipment.

The direct contributions of electronics to the fishing industry continue. Airplanes are used to spot surface schools of menhaden and tuna, and their finds are radioed to fishermen. Ship-to-shore radio-telephones enable fishermen to choose a port where they can obtain the maximum return for their catches. Electronically controlled high-intensity light sources have made possible underwater photography of fish, leading to a greater understanding of their habits. Underwater television has been used by a British research vessel on the Grand Banks for the study of redfish and cod. As fishermen go deeper and deeper to catch their fish, it is not at all improbable that blind, and often fruitless, trial tows of the nets will be replaced by the use of underwater electronic devices for the precise location of fish.

Even more interesting is the possibility that fish may be controlled and caught electrically. Tunny fishing in the North Sea is done by handline or harpoon. The tunny, a large fish measuring 12 to 14 feet in length and usually weighing over 350 pounds, frequently breaks ⅜ inch steel hooks and half-inch ropes. More than half the fish reached by hook or harpoon escape. After the first World War, American and Danish fishermen made futile attempts to electrocute the tunny. Recently, German scientists have succeeded in evolving a method by which these fish are successfully caught with an electrical fishing line. The tunny is baited in the usual way, but the hook is attached to an electrified cable. After the fish has taken the bait, it is given a short, high voltage shock by a battery-capacitor unit which dazes the fish so that it can be hauled aboard. Any large fish caught commercially on hooks, such as shark and swordfish, can be handled in this fashion.

German experiments along other lines have shown that dispersed cod and herring can be assembled in front of trawl net openings in the ocean by properly applied electrical currents. In America experiments have demonstrated that it is possible to catch fish without any conventional nets or gear by the use of a suction pump and electric lights. The time may come when fish will be driven electrically to the mouth of a great suction pump and pumped directly to the conveyors of fish processing and freezing equipment.

Technical improvements in many other fields are contributing to increased efficiency in the fishing industry. A subsequent article will discuss such new applications as the use of nylon in the manufacture of fish nets, the installation of refrigeration equipment on fishing boats and the use of filleting machines to speed up fish processing.

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The New Industrial Production Index

The Federal Reserve Board has revised its index of industrial production in the nation. This article summarizes the highlights of the revision and the significance of the results for economic analysis. A detailed description of methods and data used in compiling the new index are presented in an article in the December 1953 Federal Reserve Bulletin.

THE FEDERAL RESERVE BOARD'S index of industrial production is a widely used measure of monthly changes in this country's physical volume of output at factories and mines. The revised index supplies a much improved tool for analysis, and a more representative summary of industrial output for persons interested in general business developments or developments in specific industries or commodity markets. The revision applies mainly to the period from 1947 to date. For this period the new index takes maximum account of new data made available during the post-war period.

In a general way, changes in industrial activity since 1947 are shown to be similar by both the new and the old total indexes, as the accompanying chart shows. In the first half of 1953, both indexes indicate that activity was at a record level for the post-war period, about one-eighth above a year ago. Both show that since mid-year output has been reduced fairly generally. For October, the new index was about four per cent below the highs which it established in May and July; the old index was down about five per cent from its March peak.

Differences in production developments brought out by the new and improved measures are nevertheless important. Chief among these is the greater growth shown in post-war production. From early 1947 to early 1953 the new total index rises 35 per cent as compared with a rise of 27 per cent for the old index. Moreover, the new index shows that industrial production exceeded the World War II peak by the latter part of 1952, whereas the post-war peak of the old index, reached in early 1953, was still below the peak of late 1943.

Another important difference shown by the new index is the somewhat greater stability in output over the short-run than was indicated in the old index. This greater stability largely reflects the addition of many new industry series and the improvements in seasonal adjustments, which eliminate the recurring summer dips that had characterized the old seasonally adjusted index. New adjustments for seasonal variation have been determined for all major group indexes.

The most readily apparent — but not the most important — difference in the revised index is that it provides a more up-to-date comparison base, being calculated with the average for the years 1947-49 as 100. The old index was calculated with the years 1935-39 as 100. A more recent comparison base makes the index more convenient to use since the total and the component indexes are closer to the 100 level. A change of one point in the new total index is the same percentagewise as a change of nearly two points in the old index.

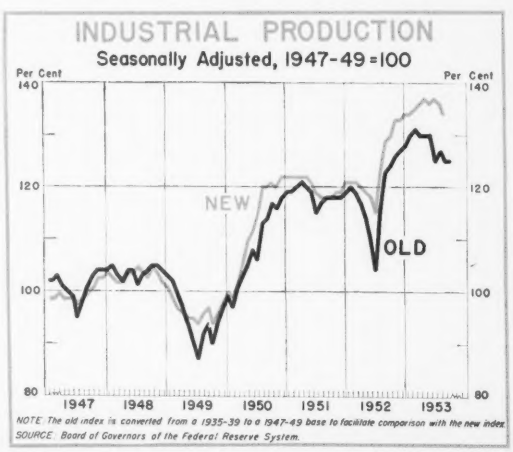
The selection of 1947-49 for the base does not imply that activity in that period is regarded as ideal or normal. The adoption of that period as a base, however, facilitates comparisons with other economic series.

Much more significant than the base period change is the increase in the number of monthly series from about 100 to 175, about 40 of which measure output in areas that had been represented only indirectly in the old index. Moreover, about half of the monthly series included in the old index have been substantially revised.

Also, industry classifications have been modernized to facilitate analysis. Adoption of the Standard Industrial Classification will permit more accurate comparisons of the revised production indexes with employment data and other economic statistics similarly classified both in this country and abroad.

To reflect the important changes since pre-war in price relationships and in composition of industrial output, the weight period used in the calculation of the relative importance of the component series has been shifted from 1937 to 1947.

While these and other improvements have been incorporated in the new index, basic concepts remain substantially unchanged. In major respects continuity of measurement back to 1919 has been preserved.

The revisions in measurement of short-run changes, through introduction of new series and determination of new seasonal factors, provide a better distinction between seasonal and other types of fluctuation in the post-war period. The revised index shows that more of the 1948–49 downturn in industrial activity was seasonal than had been apparent previously and that, for this and other reasons, the decline then was more moderate than had been indicated by the old index.

Further research continues on a long-range program which includes the development of new annual and monthly physical volume production indexes for additional important sectors of the economy. Together with work to improve the present industrial production index, this program is designed to provide a broader and firmer basis for understanding industrial changes and for interpreting economic developments.